

Diseases and Conditions

Dehydration

By Mayo Clinic Staff

Dehydration occurs when you use or lose more fluid than you take in, and your body doesn't have enough water and other fluids to carry out its normal functions. If you don't replace lost fluids, you will get dehydrated.

Common causes of dehydration include vigorous exercise, especially in hot weather; intense diarrhea; vomiting; fever or excessive sweating. Not drinking enough water during exercise or in hot weather even if you're not exercising also may cause dehydration. Anyone may become dehydrated, but young children, older adults and people with chronic illnesses are most at risk.

You can usually reverse mild to moderate dehydration by drinking more fluids, but severe dehydration needs immediate medical treatment. The safest approach is preventing dehydration in the first place. Keep an eye on how much fluid you lose during hot weather, illness or exercise, and drink enough liquids to replace what you've lost.

Mild to moderate dehydration is likely to cause:

- Dry, sticky mouth
- Sleepiness or tiredness — children are likely to be less active than usual
- Thirst
- Decreased urine output
- No wet diapers for three hours for infants
- Few or no tears when crying
- Dry skin
- Headache
- Constipation
- Dizziness or lightheadedness

Severe dehydration, a medical emergency, can cause:

- Extreme thirst
- Extreme fussiness or sleepiness in infants and children; irritability and confusion in adults
- Very dry mouth, skin and mucous membranes
- Little or no urination — any urine that is produced will be darker than normal
- Sunken eyes
- Shriveled and dry skin that lacks elasticity and doesn't "bounce back" when pinched into a fold

- In infants, sunken fontanel — the soft spots on the top of a baby's head
- Low blood pressure
- Rapid heartbeat
- Rapid breathing
- No tears when crying
- Fever
- In the most serious cases, delirium or unconsciousness

Unfortunately, thirst isn't always a reliable gauge of the body's need for water, especially in children and older adults. A better indicator is the color of your urine: Clear or light-colored urine means you're well hydrated, whereas a dark yellow or amber color usually signals dehydration.

When to see a doctor

If you're a healthy adult, you can usually treat mild to moderate dehydration by drinking more fluids, such as water or a sports drink (Gatorade, Powerade, others). Get immediate medical care if you develop severe signs and symptoms such as extreme thirst, a lack of urination, shriveled skin, dizziness and confusion.

Treat children and older adults with greater caution. Call your family doctor right away if your loved one:

- Develops severe diarrhea, with or without vomiting or fever
- Has bloody or black stool
- Has had moderate diarrhea for 24 hours or more
- Can't keep down fluids
- Is irritable or disoriented and much sleepier or less active than usual
- Has any of the signs or symptoms of mild or moderate dehydration

Go to the nearest hospital emergency room or call 911 or your emergency medical number if you think a child or older adult is severely dehydrated. You can help prevent dehydration from becoming severe by carefully monitoring someone who is sick and giving fluids, such as an oral rehydration solution (CeraLyte, Pedialyte, others), at the first sign of diarrhea, vomiting or fever and by encouraging children to drink plenty of water before, during and after exercise.

Dehydration occurs when there isn't enough water to replace what's lost throughout the day. Your system literally dries out. Sometimes dehydration occurs for simple reasons: You don't drink enough because you're sick or busy, or because you lack access to safe drinking water when you're traveling, hiking or camping.

Other dehydration causes include:

- **Diarrhea, vomiting.** Severe, acute diarrhea — that is, diarrhea that comes on suddenly and violently — can cause a tremendous loss of water and electrolytes in a short amount of time. If you have vomiting along with diarrhea, you lose even more fluids and minerals. Children and infants are especially at risk. Diarrhea may be caused by a bacterial or viral infection, food sensitivity, a reaction to medications or a bowel disorder.
- **Fever.** In general, the higher your fever, the more dehydrated you may become. If you have a fever in addition to diarrhea and vomiting, you lose even more fluids.
- **Excessive sweating.** You lose water when you sweat. If you do vigorous activity and don't replace fluids as you go along, you can become dehydrated. Hot, humid weather increases the amount you

sweat and the amount of fluid you lose. But you can also become dehydrated in winter if you don't replace lost fluids. Preteens and teens who participate in sports may be especially susceptible, both because of their body weight, which is generally lower than that of adults, and because they may not be experienced enough to know the warning signs of dehydration.

- **Increased urination.** This may be due to undiagnosed or uncontrolled diabetes. Certain medications, such as diuretics and some blood pressure medications, also can lead to dehydration, generally because they cause you to urinate or perspire more than normal.

Anyone can become dehydrated if they lose too many fluids. But certain people are at greater risk, including:

- **Infants and children.** Infants and children are especially vulnerable because of their relatively small body weights and high turnover of water and electrolytes. They're also the group most likely to experience diarrhea.
- **Older adults.** As you age, you become more susceptible to dehydration for several reasons: Your body's ability to conserve water is reduced, your thirst sense becomes less acute, and you're less able to respond to changes in temperature. What's more, older adults, especially people in nursing homes or living alone, tend to eat less than younger people do and sometimes may forget to eat or drink altogether. Disability or neglect also may prevent them from being well nourished. These problems are compounded by chronic illnesses such as diabetes, dementia, and by the use of certain medications.
- **People with chronic illnesses.** Having uncontrolled or untreated diabetes puts you at high risk of dehydration. But other chronic illnesses, such as kidney disease and heart failure, also make you more likely to become dehydrated. Even having a cold or sore throat makes you more susceptible to dehydration because you're less likely to feel like eating or drinking when you're sick. A fever increases dehydration even more.
- **Endurance athletes.** Anyone who exercises can become dehydrated, especially in hot, humid conditions or at high altitudes. But athletes who train for and participate in ultramarathons, triathlons, mountain climbing expeditions and cycling tournaments are at particularly high risk. That's because the longer you exercise, the more difficult it is to stay hydrated. During exercise, your body may lose more water than it can absorb. With every hour you exercise, your fluid debt increases. Dehydration is also cumulative over a period of days, which means you can become dehydrated with even a moderate exercise routine if you don't drink enough to replace what you lose on a daily basis.
- **People living at high altitudes.** Living, working and exercising at high altitudes (generally defined as above 8,200 feet, or about 2,500 meters) can cause a number of health problems. One is dehydration, which commonly occurs when your body tries to adjust to high elevations through increased urination and more rapid breathing — the faster you breathe to maintain adequate oxygen levels in your blood, the more water vapor you exhale.
- **People working or exercising outside in hot, humid weather.** When it's hot and humid, your risk of dehydration and heat illness increases. That's because when the air is humid, sweat can't evaporate and cool you as quickly as it normally does, and this can lead to an increased body temperature and the need for more fluids.

Dehydration can lead to serious complications, including:

- **Heat injury.** If you don't drink enough fluids when you're exercising vigorously and perspiring heavily, you may end up with a heat injury, ranging in severity from mild heat cramps to heat exhaustion or potentially life-threatening heatstroke.
- **Swelling of the brain (cerebral edema).** Sometimes, when you're getting fluids again after being

dehydrated, the body tries to pull too much water back into your cells. This can cause some cells to swell and rupture. The consequences are especially grave when brain cells are affected.

- **Seizures.** Electrolytes — such as potassium and sodium — help carry electrical signals from cell to cell. If your electrolytes are out of balance, the normal electrical messages can become mixed up, which can lead to involuntary muscle contractions and sometimes to a loss of consciousness.
- **Low blood volume shock (hypovolemic shock).** This is one of the most serious, and sometimes life-threatening, complications of dehydration. It occurs when low blood volume causes a drop in blood pressure and a drop in the amount of oxygen in your body.
- **Kidney failure.** This potentially life-threatening problem occurs when your kidneys are no longer able to remove excess fluids and waste from your blood.
- **Coma and death.** When not treated promptly and appropriately, severe dehydration can be fatal.

You're likely to start by seeing your or your child's doctor. However, in some cases when you call to set up an appointment, the doctor may recommend urgent medical care. If your child or an adult who you care for is showing signs of severe dehydration, such as lethargy or reduced responsiveness, seek immediate care at a hospital.

If you have time to prepare for your appointment, here's some information to help you get ready, and what to expect from the doctor.

What you can do

- **Write down any symptoms you're (or the person you're caring for) is experiencing,** including any that may seem unrelated to the reason for which you scheduled the appointment. If you or the person you're caring for has been vomiting or has had diarrhea, the doctor will want to know when it began and how frequently it's been occurring.
- **Write down key personal information,** including any recent trips you've taken or life changes you've made. Also include a description of your typical daily diet and any foods you've recently eaten that you suspect may have caused illness. In addition, your doctor will want to know if you or the person you're caring for has recently been exposed to anyone with diarrhea.
- **Make a list of key medical information,** including other conditions you or the person you're caring for is being treated for and the names of the medications being taken. Include on your list prescription and over-the-counter drugs, as well as any vitamins and supplements.
- **Write down questions to ask** your doctor.

For dehydration, some basic questions to ask the doctor include:

- What's causing these symptoms?
- What kinds of tests are needed?
- What treatment do you recommend?
- How soon after treatment will there be improvement?
- Are there any activity or dietary restrictions?
- Is there anything I can do to prevent a recurrence of dehydration?
- I have these other health conditions. Do I need to change the treatments I've been using?
- What steps can I take to prevent this from happening again?
- Are there any brochures or other printed material that I can take home with me? What websites do you recommend visiting?

What to expect from your doctor

Your doctor is likely to ask you a number of questions, such as:

- When did the symptoms begin? What were you doing?
- How frequently have you been experiencing loose bowel movements or vomiting?
- How recently have you urinated?
- Are you able to keep down any food or drink?
- Do you also have other symptoms, such as abdominal cramping, fever, headache or muscle aches? How severe are these symptoms?
- Has there been blood in your stools?
- Have you recently eaten any food that you suspect was spoiled?
- Has anyone gotten sick after eating the same food that you did?
- Have you recently been exposed to someone who you know was experiencing diarrhea?
- What medications are you currently taking?
- Have you recently traveled to another country?
- Do you know what your or your child's weight was before symptoms started?

What you can do in the meantime

If your child is sick, continue offering him or her small amounts of an oral rehydration solution containing electrolytes (Pedialyte, others) while you wait for your appointment. Ask your doctor to recommend the amount and frequency. Don't try to replenish fluids in a child with only water, which doesn't treat the electrolyte imbalance associated with dehydration in children, and may make symptoms worse. If you or another adult is sick, try to replenish fluids with water, an oral rehydration solution or a sports drink (Gatorade, Powerade, others).

Your doctor can often diagnose dehydration on the basis of physical signs and symptoms such as little or no urination, sunken eyes, and skin that lacks its normal elasticity and resilience when pinched. If you're dehydrated, you're also likely to have low blood pressure, especially when moving from a lying to a standing position, a faster than normal heart rate and reduced blood flow to your extremities.

To help confirm the diagnosis and pinpoint the degree of dehydration, you may have other tests, such as:

- **Blood tests.** Blood samples may be used to check for a number of factors, such as the levels of your electrolytes — especially sodium and potassium — and how well your kidneys are working.
- **Urinalysis.** Tests done on your urine can help show whether you're dehydrated and to what degree.

If it's not obvious why you're dehydrated, your doctor may order additional tests to check for diabetes and for liver or kidney problems.

The only effective treatment for dehydration is to replace lost fluids and lost electrolytes. The best approach to dehydration treatment depends on age, the severity of dehydration and its cause.

Treating dehydration in sick children

Your doctor can offer specific suggestions for treating dehydration in your child, but some general guidelines include the following:

- **Use an oral rehydration solution.** Unless your doctor advises otherwise, use an oral rehydration solution such as Pedialyte for infants and children who have diarrhea, vomiting or fever. These solutions contain water and salts in specific proportions to replenish both fluids and electrolytes.

They're also designed for easier digestion. Oral rehydration products are readily available in most drugstores, and many pharmacies carry their own brands. Begin giving fluids early in the course of an illness instead of waiting until the situation becomes urgent.

Be sure to give enough solution. Your doctor may suggest specific amounts, depending on your child's age and degree of dehydration, but a general rule of thumb is to keep giving liquids slowly until your child's urine becomes clear in color. When your child is vomiting, try giving small amounts of solution at frequent intervals — try a spoonful or so every few minutes, for instance. If your child can't keep this down, wait 30 to 60 minutes and try again. Room temperature fluids are best.

- **Continue to breast-feed.** Don't stop breast-feeding when your baby is sick, but offer your baby an oral rehydration solution in a bottle as well. If you give your baby formula, try switching to one that's lactose-free until diarrhea improves — lactose can be difficult to digest during diarrhea, making diarrhea worse. Never dilute formula more than the instructions advise. Your doctor may suggest substituting an oral rehydration solution for the formula for a short time.
- **Avoid certain foods and drinks.** The best liquid for a sick child is an oral rehydration solution — plain water doesn't provide essential electrolytes, and although sports drinks replenish electrolytes, they replace those lost through sweating, not through diarrhea or vomiting. Milk, caffeinated beverages, fruit juices or gelatins don't relieve dehydration and may make children's diarrhea symptoms worse.

Treating dehydration in sick adults

Most adults with mild to moderate dehydration from diarrhea, vomiting or fever can improve their condition by drinking more water or other liquids. Certain liquids, such as fruit juices, carbonated beverages or coffee, can make diarrhea worse.

Treating dehydration in athletes of all ages

For exercise-related dehydration, cool water is your best bet. Sports drinks containing electrolytes and a carbohydrate solution also may be helpful. There's no need for salt tablets — too much salt can lead to hyponatremic dehydration, a condition in which your body not only is short of water but also carries an excess of sodium. Avoid drinking carbonated beverages, such as colas or other types of soda.

Treating severe dehydration

Children and adults who are severely dehydrated should be treated by emergency personnel arriving in an ambulance or in a hospital emergency room, where they can receive salts and fluids through a vein (intravenously) rather than by mouth. Intravenous hydration provides the body with water and essential nutrients much more quickly than oral solutions do — something that's essential in life-threatening situations.

To prevent dehydration, drink plenty of fluids and eat foods high in water such as fruits and vegetables. Letting thirst be your guide is an adequate daily guideline for most healthy people. Fluids can be obtained not just from water but also from other beverages and foods. But, if you're exercising, don't wait for thirst to keep up with your fluids.

Under certain circumstances, you may need to take in more fluids than usual:

- **Illness.** Start giving extra water or an oral rehydration solution at the first signs of illness — don't wait until dehydration occurs. And although they might sound appealing, traditional "clear fluids" such as ginger ale or other sodas contain too much sugar and too little sodium to replenish lost electrolytes.
- **Exercise.** In general, it's best to start hydrating the day before strenuous exercise. Producing lots of

clear, dilute urine is a good indication that you're well hydrated. Before exercising, drink 1 to 3 cups (0.24 to 0.70 liters) of water. During the activity, replenish fluids at regular intervals and continue drinking water or other fluids after you're finished.

Keep in mind that drinking too much not only can cause bloating and discomfort but also may lead to a potentially fatal condition in which your blood sodium becomes too low (hyponatremia). This occurs when you drink more fluids than you lose through sweating.

- **Environment.** You need to drink additional water in hot or humid weather to help lower your body temperature and to replace what you lose through sweating. You may also need extra water in cold weather if you sweat while wearing insulated clothing. Heated, indoor air can cause your skin to lose moisture, increasing your daily fluid requirements. And altitudes greater than 8,200 feet (2,500 meters) also can affect how much water your body needs. If dehydration occurs when you're exercising in hot weather, get into a shady area, recline, and start drinking water or a sports drink. Young athletes should be encouraged to let their coaches know if they're having symptoms of dehydration.

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